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ABSTRACT

The "digital divide" refers to inequitable access to information and communication technologies (ICTs) between wealthy and poor countries and between privileged and underprivileged social groups within all countries. This presentation outlines global parameters of the digital divide, discusses the use of ICTs in education in "developing countries," and describes some activities of the U.N. Food and Agriculture Organization (FAO) aimed at bridging the divide and making education for agriculture and rural development available on a more equitable basis. International statistics show that the great majority of the world's population remains untouched by the ICT revolution. The digital divide is partly an outcome of illiteracy and low educational quality, but it is also a constraint to the improvement of educational quality, equity, and access. With regard to the worldwide initiative Education for All, the use of ICTs has been most appropriate at higher levels of education and most cost-effective in the training of teachers and extension agents. Barriers to large-scale introduction of ICTs are not only financial and technical, but also cultural and organizational. FAO has identified ICTs and the digital divide as key issues in promoting rural development. FAO is using ICTs in various distance education projects, including rural school programs, training for farmers and farm families, and linking agricultural research and extension institutions. Five guiding principles for the development and implementation of distance education programs are listed. (SV)

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Education for Agriculture and Rural Development in Low-Income Countries: Implications of the Digital Divide

Lavinia Gasperini and Scott Mclean

Paper presented a the Global Junior College (GJC)
December 3-4, 2000
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Sustainable Development Department (SD), Food and Agriculture Organization of the United Nations (FAO)

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March 2001

Education for Agriculture and Rural Development in Low-Income Countries: Implications of the Digital Divide

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This paper was presented at the Global Junior Challenge (GJC)
3-4 December 2000, Rome

Ladies and Gentlemen, first of all I would like to thank the organisers of this conference for hosting this panel discussion concerning the digital divide. My presentation will outline the parameters of the digital divide, address the relation among education and such divide, as well as the use of Information and Communication Technologies (ICTs) in education in "developing countries", and describe some FAO activities aiming at bridging this divide and making education for agriculture and rural development available on a more equitable basis.

Education is a key strategy for bringing about the changes necessary to ensure economic, cultural and social development as well as environmental protection and food security. New ICTs bring about interesting opportunities for such education. Unfortunately, such opportunities are not equally distributed among the world's population. The "digital divide" refers to inequitable access to ICTs both between wealthy and poor countries, and, within all countries, between relatively privileged and underprivileged social groups. The digital divide threatens to further marginalise vulnerable and underprivileged groups, including the rural poor, a specific target of FAO mandate.

How big is the digital divide? And how does it relate to other divides?

The numbers I will present in the next few minutes are from the: Human Development Report (1998) of the United Nations Development Programme (UNDP).

Over a billion people on our planet live in absolute poverty, and try to survive on less than one dollar a day. This is the price of a bottle of mineral water, a coffee, or half a hamburger. The UNDP's "Human Development Index" ranks the countries of the world according to their characteristics in three basic areas: longevity, education attainment and standards of living as measured by per capita Gross Domestic Product (GDP). Based upon indicators from these three areas, comparisons can be made between different categories of countries. For example, "industrialised" countries have, on average, life expectancies at birth of more than 74 years, adult literacy rates of over 98%, and per capita GDP of greater than $16,000. In comparison, "developing" countries have, on average, life expectancies at birth of about 62 years, adult literacy rates of about 70%, and GDP of about $3,000. The "least developed" countries have, instead, on average, life expectancies at birth of about 51 years, adult literacy rate of less than 50%, and GDP of barely $1,000.

By definition, there is substantial inequality, in terms of longevity, education and gross domestic product between the countries included in each of these three categories. The digital divide, or inequality in access to ICTs is equally significant. The information from the following table indicates that citizens of industrialised countries have far greater access to the full range of ICTs that can be used for educational purposes: from printing paper to the Internet.

Access to ICTs Commonly Used In Education
(Source: UNDP Human Development Report, 1998)

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Indicator (per 1,000 people in 1995)	Industrialised Countries	Developing Countries	Least Developed Countries
Consumption of printing paper (tons)	78.2	5.2	0.4
Number of radios	1005.2	185.1	113.2
Number of televisions	523.6	145.3	32.4
Number of main telephone lines	413.5	38.7	3.2
Number of personal computers	156.3	6.5	n/a
Number of Internet users	17.9	0.5	n/a

Some additional statistics from a recent BBC report add more details to the size of the digital divide globally. According to this report (from October 1999):

- More than 80% of people in the world have never heard a dialing tone, let alone sent an email or downloaded information from the World Wide Web.
- Over half of the Internet users in the world live in North America.
- Fewer than 2 % of world population is connected to Internet.
- Industrialised countries, with only 15% of the world's population, are home to 88% of all Internet users.
- Less than 1% of people in South Asia are online even though it is home to one-fifth of the world's population.
- In Africa, with 739 million people, there are only 14 million phone lines. That is fewer than in Manhattan or Tokyo. Eighty percent of those lines are in only six countries. There are only 1 million Internet users on the entire continent compared with 10.5 million in the United Kingdom.

From such international statistics it is clear that the majority of the world population still remains untouched by ICTs revolution. The emerging new economies characterised by a rapidly increasing reliance of value creation on information and knowledge, still remain concentrated in the developed countries. Unless access and use of ICTs is broadened, the majority of people, particularly in developing countries, will not enjoy the benefits of the new knowledgebased economy.

The digital divide is partly an outcomeof the "knowledge divide", and is also an importantconstraint to overcome such divide. It is partly, an outcome, since widespread illiteracy and low quality of education contributes to hamper many developing countries' efforts to develop and apply ICTs. It is a constraint, since the absence of effective systems of ICTs limit the extent to which they could be used to improve educational quality, equity and access.

What is the relationship between the ICTs and education?

In this era of globalization and knowledge based economies expansion, there are about 800 million adult illiterates and about 113 children out of school concentrated mostly in less developed regions which are also the regions where the majority of the 800 million of under nourished people are concentrated. Education can be the most effective way of evenly distributing knowledge and a crucial factor to fight poverty and achieve food security. Hence, education must reach all, since, if we do not succeed, the result will be greater disparities, inequalities and conflicts. The World Conference on Education for All, held in Jomtien in 1990, called for meeting the basic learning needs of all children, youth and adults. ICTs can help face the challenge of education for all, particularly by broadening the reach of basic education in the direction of the excluded and by enhancing and improving classroom teaching.

Studies and experiences conducted in recent years indicate some of the potentials and limitations of ICTs for achieving Education for All:

1. In basic education what is good for developing countries is what is affordable for the masses and responds to their needs. It is an issue of equity and equal opportunities. ICTs can, in some cases, compensate for what conventional systems cannot offer, but cannot be an alternative to conventional primary schools in the delivery of basic education. For example, they can help reach

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population who otherwise would not have access to education or would have a much poorer quality of education. This, however, requires abundant financial resources and well-trained teachers to guide the use of computers in the classrooms, and both of these are factors that are scarce in developing countries. Radio can enrich and extend basic education at costs much more modest than those of television or computers.

2. The use of ICTs for training teachers and extension agents, with its multiplier effects, has shown to be a more cost-effective means to raise educational quality than the direct use of ICTs in primary education or adult literacy.
3. ICTs and computers have shown to be more appropriate for higher levels of education (such as secondary and professional education, Universities, corporate training and human resources development) than for primary schools.
4. The barriers to large scale introduction of computers are not only financial and technical (connectivity, maintenance and updating of equipment) but also sociological and organizational. When computers are introduced into school they confront conservative institutions with entrenched routines that are very difficult to change. There is a need to train teachers, school principals and staff, and to mobilise parents and politicians. Curricula, didactic materials and conventional tests need also to change as a result of the introduction of ICTs, and this requires pedagogues, writers, editors, graphic design specialists, audio visual specialists, programmers - that are scarce in developing countries.

What is FAO doing to bridge the digital divide?

FAO has identified ICTs and the digital divide as key issues in meeting its mandate of helping promote rural development and build a food-secure world. ICTs can open new information and communication channels for rural communities and can be used to develop awareness among the broader public on sustainable management of natural resources and food security. In 1996, a FAO study, entitled: "The Internet and Rural Development" identified a range of activities to be undertaken in order to overcome the digital divide and mobilise the potential of ICTs to contribute to rural development such as:

- Support Internet capability into rural and agriculture education;
- Establish rural Internet pilot projects;
- Support local Internet entrepreneurs and other service providers in developing countries;
- Orient existing FAO and related Internet information services to users in developing countries;
- Support rural and remote infrastructure development.

Now, a few FAO examples of ICTs for rural development and education

FAO is utilising ICTs both for formal and nonformal education projects. In relation to the first group, I will refer, as an example, to a project that shall soon start in Chile, on introducing nutrition education in schools curriculum using the Internet. Among the projects addressing nonformal education, a first example is the project: "Communication for Development in Latin America". This internet based project aims at sharing knowledge and skills between small subsistence farmers trained and a critical mass of national staff in the production and use of various communication channels preferred by farmers and semiliterate rural population. The project proved very successful and soon spread throughout the region and beyond to: China, Mali, Indonesia, the Republic of Korea, Argentina, Costa Rica, Honduras and Mexico. Farm families were the main beneficiaries of training and information activities. Intermediaries and extension workers had acquired more knowledge, skills and experience to train farmers and provide them with technical information. All stakeholders had access to better communication tools to facilitate transfer of knowledge and skills to the wider community and to access market information.

Another example is the ExtensionResearch Communication Network (VERCON) project that aims at improving linkages between agricultural research and extension institutions. The Internet tool allows to network members to capture and develop local content; share, store, retrieve and disseminate information and connect geographically dispersed people from research and extension institutions, faculties of agricultural education, NGO workers and agricultural producers. The tool can also facilitate communication and information sharing, support improved agricultural production, further broaden and strengthen collaboration by facilitating coordination among rural, local, national and regional development programmes. I would also like to mention that, in order to guide our distance education activities we are now conducting a study to help us**define a strategy for distance education at the FAO.**

The following five guiding principles are now being discussed:

1. Distance education should be undertaken for the right reasons. Education goals must drive technology decisions. Technology is not and educational activity, it is a tool, a means to an end.
2. Distance education should be sensitive to context, and use appropriate technologies, including ICTs. (FAO works on a global scale. Some of our target groups are highly educated urban professionals with access to the latest telecommunication and computing hardware and software. Others are marginalised and illiterate rural people without access to electricity or basic telephone services. The form of distance education needs to reflect the social and political contexts of the learners).
3. Distance education should use existing infrastructure in a sustainable manner. (Rather than attempting to provide new communication infrastructure to learners, distance education initiatives must make careful and innovative use of the infrastructure available and affordable to those learners. ICTs are appropriate in some contexts, but not in others).
4. Distance education should engage stakeholders in processes of planning, implementation and

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evaluation. (The engagement of stakeholders in participatory processes helps ensure that distance education initiatives are undertaken for the right reasons, are sensitive to the contexts of the learners and to their environments, and are sustainable).

5. Distance education should be based on sound pedagogical and administrative models. (Effective distance education strategies use a coherent model of practice to ensure that they make the most of lessons learned from past experiences of teaching and learning at a distance in diverse cultural environments).

Ladies and Gentlemen, in a world where over a billion people live with less than a dollar a day, the ICTs' potential for advancing development, particularly in the developing countries, has not been fully captured. We need to break the vicious circle that links several divides, such as lack of education, low income, poor health, inadequate food security, insufficient infrastructure, capacitybuilding, investment and connectivity. These are major impediments to the participation of the majority of people in developing countries in the revolution of ICTs and in the benefits of the new knowledge based economy. By working cooperatively, we can transform the digital divide into a "digital opportunity", through a systemic approach towards a development that addresses all other divides.

Ladies and Gentlemen, thank you for your attention to my presentation. I look forward to the presentations by the other panellists, and to our subsequent discussion.

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